

A1 -- In one aspect, an isolated, non-canonical zinc finger binding protein comprising one or more non-canonical zinc finger components that bind to a target sequence is provided. The isolated zinc finger binding protein can be provided as a nucleic acid molecule or as a polypeptide. Furthermore, the target sequence can be an amino acid, DNA (*e.g.*, promoter sequence) or RNA and, additionally, may be in a prokaryotic (*e.g.*, bacteria) or eukaryotic cell (*e.g.*, plant cell, yeast cell, fungal cell, animal such as human). In certain embodiments, the amino acid sequence of one or more of the zinc finger components is X<sub>3</sub>-**B**-X<sub>2-4</sub>-Cys-X<sub>12</sub>-His-X<sub>1-7</sub>-His-X<sub>4</sub>; X<sub>3</sub>-Cys-X<sub>2-4</sub>-**B**-X<sub>12</sub>-His-X<sub>1-7</sub>-His-X<sub>4</sub>; X<sub>3</sub>-Cys-X<sub>2-4</sub>-Cys-X<sub>12</sub>-**Z**-X<sub>1-7</sub>-His-X<sub>4</sub>; X<sub>3</sub>-Cys-X<sub>2-4</sub>-Cys-X<sub>12</sub>-His-X<sub>1-7</sub>-**Z**-X<sub>4</sub>; X<sub>3</sub>-**B**-X<sub>2-4</sub>-**B**-X<sub>12</sub>-His-X<sub>1-7</sub>-His-X<sub>4</sub>; X<sub>3</sub>-**B**-X<sub>2-4</sub>-Cys-X<sub>12</sub>-**Z**-X<sub>1-7</sub>-His-X<sub>4</sub>; X<sub>3</sub>-**B**-X<sub>2-4</sub>-Cys-X<sub>12</sub>-His-X<sub>1-7</sub>-**Z**-X<sub>4</sub>; X<sub>3</sub>-Cys-X<sub>2-4</sub>-**B**-X<sub>12</sub>-**Z**-X<sub>1-7</sub>-His-X<sub>4</sub>; X<sub>3</sub>-Cys-X<sub>2-4</sub>-**B**-X<sub>12</sub>-His-X<sub>1-7</sub>-**Z**-X<sub>4</sub>; X<sub>3</sub>-Cys-X<sub>2-4</sub>-Cys-X<sub>12</sub>-**Z**-X<sub>1-7</sub>-**Z**-X<sub>4</sub>; X<sub>3</sub>-Cys-X<sub>2-4</sub>-**B**-X<sub>12</sub>-**Z**-X<sub>1-7</sub>-**Z**-X<sub>4</sub>; X<sub>3</sub>-**B**-X<sub>2-4</sub>-Cys-X<sub>12</sub>-**Z**-X<sub>1-7</sub>-**Z**-X<sub>4</sub>; X<sub>3</sub>-**B**-X<sub>2-4</sub>-**B**-X<sub>12</sub>-His-X<sub>1-7</sub>-**Z**-X<sub>4</sub>; X<sub>3</sub>-**B**-X<sub>2-4</sub>-**B**-X<sub>12</sub>-**Z**-X<sub>1-7</sub>-His-X<sub>4</sub>; and X<sub>3</sub>-**B**-X<sub>2-4</sub>-**B**-X<sub>12</sub>-**Z**-X<sub>1-7</sub>-**Z**-X<sub>4</sub> (SEQ ID NOS:118-132, respectively) wherein X is any amino acid, B is any amino acid except cysteine and Z is any amino acid except histidine. --

Please replace the paragraph beginning on page 7, line 19 with the following rewritten paragraph:

-- Thus, in preferred embodiments, one or more zinc coordinating fingers making up the zinc finger protein has any of the following sequences:

A2 X<sub>3</sub>-**B**-X<sub>2-4</sub>-Cys-X<sub>12</sub>-His-X<sub>1-7</sub>-His-X<sub>4</sub> (SEQ ID NO:118)

X<sub>3</sub>-Cys-X<sub>2-4</sub>-**B**-X<sub>12</sub>-His-X<sub>1-7</sub>-His-X<sub>4</sub> (SEQ ID NO:119)

X<sub>3</sub>-Cys-X<sub>2-4</sub>-Cys-X<sub>12</sub>-**Z**-X<sub>1-7</sub>-His-X<sub>4</sub> (SEQ ID NO:120)

X<sub>3</sub>-Cys-X<sub>2-4</sub>-Cys-X<sub>12</sub>-His-X<sub>1-7</sub>-**Z**-X<sub>4</sub> (SEQ ID NO:121)

X<sub>3</sub>-**B**-X<sub>2-4</sub>-**B**-X<sub>12</sub>-His-X<sub>1-7</sub>-His-X<sub>4</sub> (SEQ ID NO:122)

X<sub>3</sub>-**B**-X<sub>2-4</sub>-Cys-X<sub>12</sub>-**Z**-X<sub>1-7</sub>-His-X<sub>4</sub> (SEQ ID NO:123)

X<sub>3</sub>-**B**-X<sub>2-4</sub>-Cys-X<sub>12</sub>-His-X<sub>1-7</sub>-**Z**-X<sub>4</sub> (SEQ ID NO:124)

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$X_3\text{-Cys-}X_{2.4}\text{-B-}X_{12}\text{-Z-}X_{1.7}\text{-His-}X_4$	(SEQ ID NO:125)
$X_3\text{-Cys-}X_{2.4}\text{-B-}X_{12}\text{-His-}X_{1.7}\text{-Z-}X_4$	(SEQ ID NO:126)
$X_3\text{-Cys-}X_{2.4}\text{-Cys-}X_{12}\text{-Z-}X_{1.7}\text{-Z-}X_4$	(SEQ ID NO:127)
$X_3\text{-Cys-}X_{2.4}\text{-B-}X_{12}\text{-Z-}X_{1.7}\text{-Z-}X_4$	(SEQ ID NO:128)
$X_3\text{-B-}X_{2.4}\text{-Cys-}X_{12}\text{-Z-}X_{1.7}\text{-Z-}X_4$	(SEQ ID NO:129)
$X_3\text{-B-}X_{2.4}\text{-B-}X_{12}\text{-His-}X_{1.7}\text{-Z-}X_4$	(SEQ ID NO:130)
$X_3\text{-B-}X_{2.4}\text{-B-}X_{12}\text{-Z-}X_{1.7}\text{-His-}X_4$	(SEQ ID NO:131)
$X_3\text{-B-}X_{2.4}\text{-B-}X_{12}\text{-Z-}X_{1.7}\text{-Z-}X_4$	(SEQ ID NO:132)

where      X= any amino acid  
              B= any amino acid except cysteine  
              Z= any amino acid except histidine --

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Please replace the paragraph beginning on page 17, line 20 with the following rewritten paragraph:

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-- A component finger of a zinc finger protein typically contains approximately 30 amino acids and comprises the following canonical consensus sequence (from N to C):  
Cys-(X)<sub>2.4</sub>-Cys-X<sub>12</sub>-His-(X)<sub>3.5</sub>-His (SEQ ID NO:1) --

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Please replace the paragraph beginning on page 19, line 14 with the following rewritten paragraph:

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-- Non-canonical zinc fingers therefore include one or more zinc finger components in which at least one of the C2H2 amino acids has been replaced with one or more amino acids. In certain embodiments, more than one of the canonical amino acids is replaced. Examples of non-canonical zinc finger components include:

$X_3\text{-B-}X_{2.4}\text{-Cys-}X_{12}\text{-His-}X_{1.7}\text{-His-}X_4$  (SEQ ID NO:118)  
 $X_3\text{-Cys-}X_{2.4}\text{-B-}X_{12}\text{-His-}X_{1.7}\text{-His-}X_4$  (SEQ ID NO:119)

X<sub>3</sub>-Cys-X<sub>2.4</sub>-Cys-X<sub>12</sub>-Z-X<sub>1.7</sub>-His-X<sub>4</sub> (SEQ ID NO:120)  
X<sub>3</sub>-Cys-X<sub>2.4</sub>-Cys-X<sub>12</sub>-His-X<sub>1.7</sub>-Z-X<sub>4</sub> (SEQ ID NO:121)  
X<sub>3</sub>-B-X<sub>2.4</sub>-B-X<sub>12</sub>-His-X<sub>1.7</sub>-His-X<sub>4</sub> (SEQ ID NO:122)  
X<sub>3</sub>-B-X<sub>2.4</sub>-Cys-X<sub>12</sub>-Z-X<sub>1.7</sub>-His-X<sub>4</sub> (SEQ ID NO:123)  
X<sub>3</sub>-B-X<sub>2.4</sub>-Cys-X<sub>12</sub>-His-X<sub>1.7</sub>-Z-X<sub>4</sub> (SEQ ID NO:124)  
X<sub>3</sub>-Cys-X<sub>2.4</sub>-B-X<sub>12</sub>-Z-X<sub>1.7</sub>-His-X<sub>4</sub> (SEQ ID NO:125)  
X<sub>3</sub>-Cys-X<sub>2.4</sub>-B-X<sub>12</sub>-His-X<sub>1.7</sub>-Z-X<sub>4</sub> (SEQ ID NO:126)  
X<sub>3</sub>-Cys-X<sub>2.4</sub>-Cys-X<sub>12</sub>-Z-X<sub>1.7</sub>-Z-X<sub>4</sub> (SEQ ID NO:127)  
X<sub>3</sub>-Cys-X<sub>2.4</sub>-B-X<sub>12</sub>-Z-X<sub>1.7</sub>-Z-X<sub>4</sub> (SEQ ID NO:128)  
X<sub>3</sub>-B-X<sub>2.4</sub>-Cys-X<sub>12</sub>-Z-X<sub>1.7</sub>-Z-X<sub>4</sub> (SEQ ID NO:129)  
X<sub>3</sub>-B-X<sub>2.4</sub>-B-X<sub>12</sub>-His-X<sub>1.7</sub>-Z-X<sub>4</sub> (SEQ ID NO:130)  
X<sub>3</sub>-B-X<sub>2.4</sub>-B-X<sub>12</sub>-Z-X<sub>1.7</sub>-His-X<sub>4</sub> (SEQ ID NO:131)  
X<sub>3</sub>-B-X<sub>2.4</sub>-B-X<sub>12</sub>-Z-X<sub>1.7</sub>-Z-X<sub>4</sub> (SEQ ID NO:132)  
X<sub>3</sub>-Y-X<sub>2.4</sub>-Cys-X<sub>12</sub>-His-X<sub>1.7</sub>-His-X<sub>4</sub> (SEQ ID NO:133)  
X<sub>3</sub>-Cys-X<sub>2.4</sub>-Y-X<sub>12</sub>-His-X<sub>1.7</sub>-His-X<sub>4</sub> (SEQ ID NO:134)  
X<sub>3</sub>-Cys-X<sub>2.4</sub>-Cys-X<sub>12</sub>-Y-X<sub>1.7</sub>-His-X<sub>4</sub> (SEQ ID NO:135)  
X<sub>3</sub>-Cys-X<sub>2.4</sub>-Cys-X<sub>12</sub>-His-X<sub>1.7</sub>-Y-X<sub>4</sub> (SEQ ID NO:136)  
X<sub>3</sub>-Y-X<sub>2.4</sub>-Y-X<sub>12</sub>-His-X<sub>1.7</sub>-His-X<sub>4</sub> (SEQ ID NO:137)  
X<sub>3</sub>-Y-X<sub>2.4</sub>-Cys-X<sub>12</sub>-Y-X<sub>1.7</sub>-His-X<sub>4</sub> (SEQ ID NO:138)  
X<sub>3</sub>-Y-X<sub>2.4</sub>-Cys-X<sub>12</sub>-His-X<sub>1.7</sub>-Y-X<sub>4</sub> (SEQ ID NO:139)  
X<sub>3</sub>-Cys-X<sub>2.4</sub>-Y-X<sub>12</sub>-Y-X<sub>1.7</sub>-His-X<sub>4</sub> (SEQ ID NO:140)  
X<sub>3</sub>-Cys-X<sub>2.4</sub>-Y-X<sub>12</sub>-His-X<sub>1.7</sub>-Y-X<sub>4</sub> (SEQ ID NO:141)  
X<sub>3</sub>-Cys-X<sub>2.4</sub>-Cys-X<sub>12</sub>-Y-X<sub>1.7</sub>-Y-X<sub>4</sub> (SEQ ID NO:142)  
X<sub>3</sub>-Cys-X<sub>2.4</sub>-Y-X<sub>12</sub>-Y-X<sub>1.7</sub>-Y-X<sub>4</sub> (SEQ ID NO:143)  
X<sub>3</sub>-Y-X<sub>2.4</sub>-Cys-X<sub>12</sub>-Y-X<sub>1.7</sub>-Y-X<sub>4</sub> (SEQ ID NO:144)  
X<sub>3</sub>-Y-X<sub>2.4</sub>-Y-X<sub>12</sub>-His-X<sub>1.7</sub>-Y-X<sub>4</sub> (SEQ ID NO:145)  
X<sub>3</sub>-Y-X<sub>2.4</sub>-Y-X<sub>12</sub>-Y-X<sub>1.7</sub>-His-X<sub>4</sub> (SEQ ID NO:146)

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